Construction and Demolition (C&D) Recycling Issue Paper
2001 JTR Recycling Market Development Roundtable

Introduction

The purpose of this paper is to provide background information on the subject of 'Construction and Demolition Debris' and a summary of the discussion that occurred at the 2001 JTR Recycling Market Development Roundtable. This is intended to be a "start" and does not necessarily reflect all of the issues surrounding C&D debris recycling and management. Over the past several years, federal, state and local government officials have started to focus their attention on this huge component of the waste stream, recognizing the opportunity to recycle large portions of this waste stream. Although materials managed from construction and/or demolition are believed to be largely inert, there are increasing concerns regarding the environmental impacts of some of these materials.

Current Situation

Construction and demolition debris (C&D) is generated from many different sources. Generally, C&D can be separated into three main categories: 1) building construction, demolition and renovation; 2) transportation (roads, bridges, landscaping) construction and demolition; and 3) land clearing debris. Another category is disaster debris, which requires alternative management strategies by federal, state and local officials. There are a wide range of materials generated in these three categories; including, asphalt, concrete, wood (clean, painted and pressure treated - all requiring different management technics), gypsum drywall, ferrous and non-ferrous metals, asphalt shingles, and land clearing debris. Although most of the C&D waste stream does not contain hazardous waste, some hazardous waste or potentially harmful materials are encountered as a result of C&D activities. These materials can include lead based paint, asbestos, mercury, pressure treated lumber and other potentially harmful materials and/or chemicals.

Many of the C&D related waste materials have traditionally been recycled by industry, including asphalt, concrete and metal. However, there are still limited markets for many high volume materials such as gypsum and wood products. The main factors that limit recycling of C&D waste are the same as many other traditionally recyclables:

- Low landfill tipping fees
- Lack of value-added markets
- Lack of data on quantity and composition of C&D components
- High start-up and operating costs
- Cost of 'time' required to manage and separate materials on-site
- Lack of sound business plans and knowledge of running a business
- Fragmented nature of the C&D industry
- C&D facilities dependency of C&D landfills for residuals used as Alternative Daily Cover

Recent/Ongoing Efforts

EPA published the 'Characterization of Building-Related Construction and Demolition Debris in the United States' in June 1998 and has several ongoing projects to encourage C&D recycling

and 'green building' initiatives. Many states and other organizations have conducted studies, pilot projects and other efforts to better understand and increase recycling of the C&D waste stream. Some of those include:

Location	Activities
Colorado	A private sector construction firm recently recycled C&D materials at its job site and saved money in the process. The firm is currently promoting its efforts throughout the state.
Massachusetts	Working with state regulators on permitting and enforcement issues and asking them to address recycling issues through these established processes.
Minnesota	Researching market applications for tear off shingles.
Oregon	For buildings with more than 50,000 square-feet, all C&D materials must be recycled on site.
San Jose, California	Contractors pay a fee in order to demolish a building. If the C&D materials are reused, the money is returned pending verification by a licensed third-party.
Texas	The state department of transportation is funding C&D recovery through non-point source pollution funds.

- North Carolina's 1998 N.C. Markets Assessment of the Recycling Industry and Recyclable Materials (included C&D)
- Florida's C&D Debris Recycling Study: Final Report - March, 2001 http://www.dep.state.fl.us/dwm/programs/recycling/documents/canddreport.htm
- University of Florida's Construction and Demolition Waste Management: An Overview - February 2001
- Construction Materials Recycling Association and EPA Region 5's Asphalt Shingle Study
- NAHB Research Center's 'On-Site Grinding of Residential Construction Debris: The Indiana Grinder Pilot
- Vermont Gypsum Study - http://www.anr.state.vt.us/dec/wastediv/recycling/gypsum.pdf
- Summary Report - Demolition Materials Diversion Symposium, Inn at the Quay, New Westminster, BC, Canada May 12-13, 1998, Dovetail Consulting Inc. and SALASAN Associates, Inc. for the Pollution Prevention and Remediation Branch, BC Environment, Canada.
- Abdres, A. & Wiebe, D., Survey Results Data for Used Building Materials Stores in North America, Winnipeg, Manitoba, Canada: Environment Canada, April, 1997.
- Pollock, B., Construction & Demolition Materials Management for Orange County, North Carolina, November 9, 1999.
- Sawatsky, B., & Corson, J., Increasing the Volume of Used Building Materials in Canadian Construction, Canada Mortgage and Housing Corporation, June 1998.

- Mid-Atlantic Consortium of Recycling and Economic Development Officials (MACREDO) has develop a publication entitled Recycling and Reuse in the Residential Construction Industry, which is available at http://www.libertynet.org/~macredo/crrprj.htm
- The New Hampshire Recycled Materials Resource Center is sponsoring a conference entitled, "Beneficial Use of Recycled Materials in Transportation Applications" in Washington, DC, on November 13 to 15, 2001. Visit <http://www.rmrc.unh.edu/2001Conf/overview.asp> for more information.

Significant Barriers

The group brainstormed the following barriers to increased construction and demolition (C&D) debris reuse and recycling:

- Absence (and lack of acceptance) of proven, performance-based specifications, particularly for concrete aggregate.
- Lack of testing to ensure recycled-content construction materials meet performance specifications.
- Contamination concerns including lead-based paint on used wood and asbestos as a building material.
- Lack of markets for sheet rock and tear off shingles, although they are two major C&D materials.
- Lack of centralized information and research studies on C&D materials.
- Low tipping fees for most, if not all, C&D materials.
- Lack of recognition of the differences between C&D collection and recycling in urban and rural areas.
- High costs for C&D collection and recovery in rural areas.
- Perception by state departments of transportation that recycled-content and reused building materials are inferior.
- Lack of knowledge about C&D recycling and recycled-content building products by end-users, including the green building community.
- Lack of awareness about site-specific opportunities for C&D recovery and reuse.
- Requirements by contractors doing road work for a "letter of no objection" before using C&D materials.
- Lack of sophistication in marketing recycled-content building products.
- Difficulty breaking into established markets dominated by virgin materials.
- Lack of design for recyclability in existing building products.
- Highly variable waste streams which change from construction/demolition site to site.
- Lack of guaranteed supply of recovered C&D materials.
- Difficulty obtaining approval for deconstruction considering timing, scheduling, and cost issues.
- Regulations that do not differentiate construction from demolition.
- Land use and zoning restrictions on C&D recovery from building sites.

- Lack of cooperation and coordination within the construction industry.
- Vertical integration of the road building industry.
- Franchising issues such as those in Florida and Oregon.
- In Arizona, there is no local control of C&D recovery if a community has a population of more than 60,000.

Potential Solutions

The group brainstormed potential solutions to increase C&D reuse and recycling and then ranked its top four options. The group then discussed potential activities to support each of the "primary" options.

Primary

- Develop and implement a national communications strategy on C&D recycling.
    - Create a national database of C&D recyclers with listings organized by region. (currently being considered by EPA)
    - Pose a "Question of the Month" about C&D on JTRnet.
    - Collect and disseminate information on C&D recycling to national trade associations.
    - Coordinate with NRC to leverage its communications capabilities.
    - Create a national workgroup to explore C&D certification and support the certification program currently offered by CMRA and SWANA. (Upcoming courses are scheduled for WasteCon and CMRA's annual conference).
    - Collaborate with the existing pollution prevention electronics network.
    - Provide national, peer-to-peer facilitation for the C&D recycling industry to promote stakeholder dialogue.
    - Communicate the benefits of green buildings, including that they may cost more initially but will save money over the long term in reduced maintenance costs.
- Conduct high-quality, broad-based studies to identify and evaluate markets for C&D materials:
    - Evaluate existing reports and research needs for C&D recycling.
    - Research and document opportunities for recovering engineered wood products (e.g., pressboard), gypsum drywall, and asphalt shingles.
    - Research issues related to handling lead-based painted wood.
    - Validate existing reports on specific commodities.
    - Work in collaboration with CMRA.
- Hire a recycling advocate within the state department of transportation:

  - This strategy has proven successful for Pennsylvania.

- Create, disseminate, and adopt model specifications for C&D recovery and recycling as part of state and federal government contracts for new construction and renovation projects. (California has sample specification language.)

  - Include requirements for C&D recycling in public sector permits for new building construction.
  - Expedite the permit process for use of "green" materials.
  - Develop and disseminate guidance documents and specifications that can be tailored locally.
  - Develop case studies of successful projects.

Secondary

- Make the link with "green building" to leverage its broad (and growing) customer base.
- Add specifications for deconstruction into government building contracts.
- Require C&D recycling for construction, renovation, and demolition projects receiving federal funding.
- Adopt and promote the U.S. Green Building Council's LEED rating system which evaluates and awards green buildings using a standard checklist, providing a strong incentive for builders and homeowners.
- Research and disseminate information on deconstruction, including best practices.
- Offer tax credits to homebuyers for deconstruction, use of deconstructed materials, and diversion from new building job sites.
- Promote successful models of technical assistance to businesses.
- Educate builders about the opportunities for savings at industrial construction sites.
- Work with large road contractors, encouraging them to use "green" materials.
- Research the various policy options and implications for increasing C&D recycling, such as landfill bans enacted at the local level.
- Increase use of JTRnet and the JTR Web site.
- Develop a financing guidebook for C&D operations.
- Leverage non-traditional sources of funding.
- Provide incentives to small entrepreneurs to develop innovative technologies for C&D recycling.
- Provide technologies to larger firms with the economies of scale to implement broad-based programs.
- Conduct GIS mapping of the location of C&D material sources across the United States.